Microwave Powered Gravitationally Independent Medical Grade Water Generation, Phase I

Completed Technology Project (2006 - 2006)

Project Introduction

An innovative microwave system is proposed for the continuous production of medical grade water. This system will utilize direct absorption of microwave radiation to rapidly heat potable water well above normal autoclave conditions, achieving equivalent microbial lethality in much shorter times. High thermal efficiencies will be gained by placement of the microwave antennae directly in the flowing water stream allowing very efficient volumetric coupling of microwaves. The sterilized water stream will then pass through a regenerable endotoxin filter to achieve water for injection (WFI) purity standards. This filter will remove endotoxins by selective adsorption. The combined system will enable the energy efficient and practical production of WFI aboard spacecraft or planetary habitats under microgravity or hypogravity conditions with a low equivalent system mass (ESM). In the Phase I research, sterilization chambers and endotoxin filters will be designed, assembled, and tested. The Phase II program will deliver a fully instrumented, computer-controlled system with a low ESM whose performance is well documented. This technology will form the basis for multiple applications in commercial sterilization markets.

Primary U.S. Work Locations and Key Partners

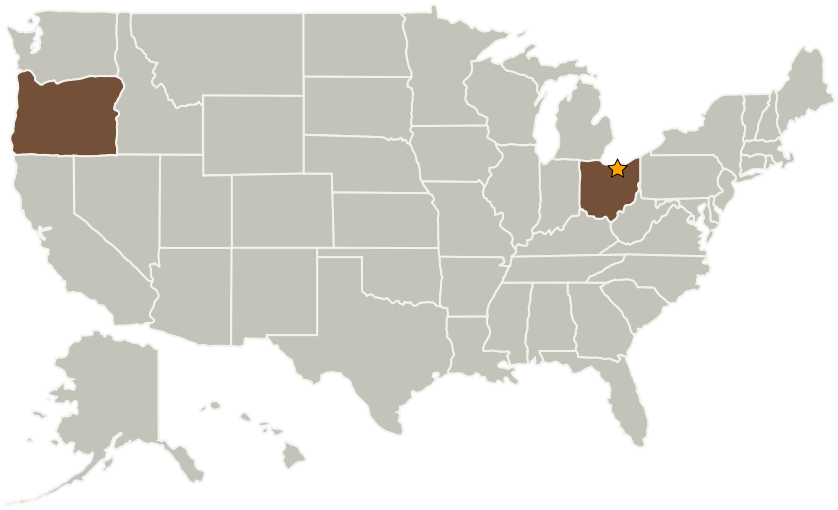

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Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
UMPQUA Research Company	Supporting Organization	Industry	Myrtle Creek, Oregon

Primary U.S. Work Locations	
Ohio	Oregon

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.4 Environmental Monitoring, Safety, and Emergency Response
    - TX06.4.4 Remediation